

WHAT IS CLAIMED IS:

1. A method for producing a formed member made of a steel sheet comprising the steps of:

5 preparing a steel sheet material having tensile strength of 500 MPa or less and containing a nitriding element;

forming a formed member having a predetermined shape by performing a plastic forming on the steel sheet material; and

10 performing a nitriding treatment on the formed member so that an average hardness in the sheet thickness direction of the resultant steel sheet member is Hv 300 or more by Vickers hardness.

2. The method for producing a formed member made of a steel sheet according to claim 1, wherein the steel sheet material contains as the nitriding element, a predetermined amount of at least one element of titanium (Ti), niobium (Nb), boron (B), vanadium (V) and aluminum (Al).

20 3. The method for producing a formed member made of a steel sheet according to claim 1, wherein the difference in hardness between the surface part and the inside center part in the thickness direction of the steel sheet member of the formed member is Hv 200 or less

by Vickers hardness.

4. The method for producing a formed member made of a steel sheet according to claim 1, wherein only a specific region of the formed member is strengthened by the nitriding treatment, and when the formed member bent-
5 deforms, it deforms at a boundary between the specific region and the unspecific region as an origin.

5. The method for producing a formed member made of a steel sheet according to claim 4, wherein before the
10 nitriding treatment, a masking treatment is performed on the part other than the specific region of the formed member.

6. The method for producing a formed member made of a steel sheet according to claim 4, wherein the
15 nitriding treatment is performed while only the specific region of the formed member is immersed in a salt bath.

7. The method for producing a formed member made of a steel sheet according to claim 1, wherein forming the formed member having a predetermined shape is
20 performed by a method comprising the steps of:

preparing a first blank material and a second blank material having different properties for a predetermined specification as the steel sheet materials;

forming a preform by joining those blank
25 materials; and

performing a plastic forming on the preform to obtain a formed member of a predetermined shape.

8. The method for producing a formed member made of a steel sheet according to claim 1, wherein the formed member has a closed section shape and is reinforced by a method comprising the steps of:

setting a foam material to a region subjected to the nitriding treatment; and

causing the foam material to expand by heating the formed member.

9. The method for producing a formed member made of a steel sheet according to claim 1, wherein forming the formed member having a predetermined shape is performed by a method comprising the steps of:

forming a preform having a closed section shape which is relatively approximate to the final shape of the formed member;

setting the preform in a predetermine mold; and

forming the preform by supplying the closed section space thereof with a pressurized fluid to obtain the formed member corresponding to a shape of the mold.

10. A formed member made of a steel sheet having an average hardness in the sheet thickness direction of Hv 300 or more by Vickers hardness by plastically forming a steel sheet having a tensile strength of 500 MPa or less

and containing a nitriding element into a predetermined shape and performing a nitriding treatment after the plastic forming.

11. A formed member made of a steel sheet according to claim 10, wherein the formed member is formed to a predetermined shape by a plastic forming on a preform obtained by joining a first blank material and a second blank material having different properties for a predetermined specification.

12. A formed member made of a steel sheet according to claim 10, wherein the formed member has a closed section shape and at least a part of the formed member is filled with foamed material, by setting a foam material to at least a region subjected to the nitriding treatment and causing the foam material to expand by heating the formed member.

13. A formed member made of a steel sheet according to claim 10, wherein the formed member is formed to a predetermined shape by forming a preform having a closed section shape which is relatively approximate to the final shape of the formed member, setting the preform in a predetermine mold, and forming the preform by supplying the closed section space thereof with a pressurized fluid to obtain the formed member corresponding to a shape of the mold.